

THE MANITOBA MUSEUM



PRESERVATION

CONSERVATION

CIVIC AUDITORIUM

WINNIPEG

MANITOBA

THE COVER

Design by HAROLD MARCHANT

THE SUBJECTS shown on the cover are intended to represent some of the departments of natural history and the early history of the Province, of which substantial collections may be seen in the Museum.

Superimposed upon the Province are a Plains Indian suggesting the study of both Indians and Eskimos; a duck, indicating the study of birds; the wapiti (often miscalled the elk) suggesting the study of mammals. The wapiti was chosen as being peculiarly apt, as its scientific name is *Cervus canadensis manitobensis*, although it has a wide range in the U.S.A.

Quasibia Meano canadensis Warren.

To represent the study of insects, a butterfly, the *Monarch*, is depicted. Botany is suggested by the showy lady slipper. The study of fossils is shown by an ammonite (an ancestor of the squid and octopus) of which vast numbers formerly inhabited the ancient seas of Manitoba. The Red River cart points to the study of the white explorers and the early settlers in this Province.

PURPOSES OF A MUSEUM

THE PURPOSES of the Museum are, as indicated on the front cover, to *collect* and *preserve* material of scientific value and to display some of the material for the education and entertainment of visitors. A great deal of the collections in Museums cannot possibly be kept on display; the collections of skins of mammals and birds are kept in cabinets to preserve them from insects and strong light. Preservation is not merely keeping in a safe place, but involves frequent checking for insects or fading, and, in certain materials, repairs from time to time. To preserve any animals requires some expense, and in the case of large mammals and birds, a great deal of expense is involved.

Another purpose of the Museum is to *educate* people, especially the young. As in other Museums, classes of school pupils attend by appointment, accompanied by teachers, and have lectures lasting about forty-five minutes, preceded by a fifteen minute period during which the pupils look at any cases they may choose, and may ask questions. The number of pupils attending these classes varies from 4,000 to 6,000 per annum. Most of these classes are arranged by ladies of the Junior League whose assistance has been very valuable. An attempt has been made, where it is practicable, to make the labels explain the objects, so that some self-education is possible. These displays are also used extensively by University Students and, in the mineral section, by Prospectors. *Conservation* is constantly referred to, and instances of what it has done and what it might have done in times past are given in order to stress its value. An attempt is made to get facts and to discard guess-work; in such a large territory there is a tremendous lot yet to be learned about the fauna and flora of our Province. In this work, people in rural districts can give us, as they have already given us, valuable aid.

MUSEUM HOURS

SUNDAY—Closed in Summer; 2 to 5 p.m. in Winter

MONDAY TO FRIDAY—Summer and Winter, 9.30 to 5 p.m.

SATURDAY—Summer, 9.30 to 12 noon; Winter, 9.30 to 5 p.m.

SECTION A—Top floor, West wing. Main gallery.

SECTION B—Top floor, West wing. Mineral room.

SECTION C—Ground floor, West wing. General.

SECTION D—Ground floor, East wing. General.

ADMISSION
Free at
all times

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THE MANITOBA MUSEUM



The Museum, showing Section A from the entrance.

PREPARED BY
L. T. S. NORRIS-ELYE
Director of the Museum



OFFICERS, 1944

CARL E. AUSTIN Hon. President	DR. H. M. SPEECHLY President	R. K. STEWART-HAY Vice-President
G. SHIRLEY BROOKS Hon. Secretary	W. H. DARRACOTT Hon. Treasurer	L. T. S. NORRIS-ELYE Hon. Director
W. H. RAND Museum-Keeper		

HONORARY CURATORS

SECTIONS	SECTIONS —	SUB-SECTIONS
BOTANY Prof. C. W. Lowe Prof. H. J. Brodie Mrs. E. J. McMillan Mrs. A. Simpson	GEOLOGY Dr. G. M. Brownell P. Stokes ZOOLOGY (Vertebrate) Prof. R. K. Stewart-Hay J. Dewey Soper	<i>Palaeontology</i> Prof. E. I. Leith Mrs. R. Helyar <i>Ichthyology</i> L. T. S. Norris-Elye <i>Ornithology</i> A. G. Lawrence B. W. Cartwright A. Shortt
ETHNOLOGY Dr. H. M. Speechly W. H. Rand	ZOOLOGY (Invertebrate) Prof. R. A. Wardle Dr. J. McLeod	<i>Conchology</i> Mrs. P. Stokes <i>Entomology</i> G. Shirley Brooks Dr. R. D. Bird J. B. Wallis

COMMITTEES

LEGISLATION AND RESOLUTIONS — L. T. S. Norris-Elye, W. H. Darracott, B. W. Cartwright.
MEMBERSHIP — Mrs. A. Simpson, P. H. Stokes, H. J. Peck, W. H. Rand.
EQUIPMENT — A. G. Lawrence, L. T. S. Norris-Elye, G. Shirley Brooks, W. H. Rand.
FINANCE — Carl E. Austin, Dr. H. M. Speechly, W. H. Darracott.
LIBRARY — C. W. Lowe, R. K. Stewart-Hay, L. T. S. Norris-Elye.

MUSEUM SUPPORT

THE MUSEUM receives a small annual grant from the City of Winnipeg, and a smaller grant from the Provincial Government. In addition, the Junior League has made an annual donation. Annual membership fees of \$1.00 produce from \$50.00 to 75.00. A donation box produces \$100.00 per annum.

The Civic Auditorium Commission supplies space, heat and light free of charge, and has lent several of the large exhibition cases in the two main floor galleries.

The Museum is operated by the Director in collaboration with the various Curators, all of whom donate their time. Some of the Curators are members of the staff of the University of Manitoba, and all are supporters of the Manitoba Natural History Society. Policies are determined by an Executive Committee. Exhibits are largely derived by gift from people in Manitoba, a substantial number of whom live in rural districts. Several gifts have come from other Provinces, especially from the Western Provinces. Some very valuable material is on loan, but much of this may be donated to the Museum later on.

There is a small library with some very valuable volumes, but it needs enlarging very considerably when funds are available. The majority of the volumes were donated by the large institutions and by private individuals. The library lacks a good encyclopaedia and many standard text-books. There is shelf room for substantial enlargement.

FOREWORD

THE PURPOSE of this brochure is primarily to convey a flavour of the Museum to those who cannot visit it personally and to tempt others to find time to pay us a visit in order to see for themselves what a wealth of scientific and historical material this Province can show.

In a small brochure it is possible to give only a very brief outline of the contents of the Museum and some idea as to what has been accomplished and what could further be accomplished with reasonable support. For instance, there is no illustration of the minerals, many of which owe their beauty to colour, crystal formations, texture, and so on, and these have to be seen first hand. Also, the display of fluorescing minerals cannot be illustrated; they must be seen in darkness, and then they are found to be about the most exquisite forms of colouring known to science. Be sure to visit them in the main gallery.

When people state their opinion that we have a wonderful Province, they usually speak in terms of scenery and of sport, or perhaps of the cash value of the natural resources. Certainly, we have a wonderful Province in all these respects, but few people realize how much more wonderful it is than they have ever suspected. Consider the immense numbers of different plants, animals, rocks and fossils we possess. No one can get the greatest amount of enjoyment out of hunting animals of which he knows little, or of catching fish, the habits of which he knows little. In the woods or at the rivers and lakes, people ask themselves such questions as: What is that plant? What is that animal? Why does that bird behave like that? What is that insect trying to do? Some of these questions can be answered readily by frequent visits to any Museum. In too many cases children ask parents these questions, which remain unanswered, or are answered incorrectly. Often the child is able to answer the parent's question.

The classes of school pupils at the Museum have stimulated a widespread interest among the children; they have given them something worthwhile to think about when they are out of doors, instead of some things a great deal less desirable. In the large cities of the East and South, the Museums are recognized as an essential factor in education. The citizens are proud of their Museums as centres of culture. This has invariably taken place as the general standard of culture ascends.

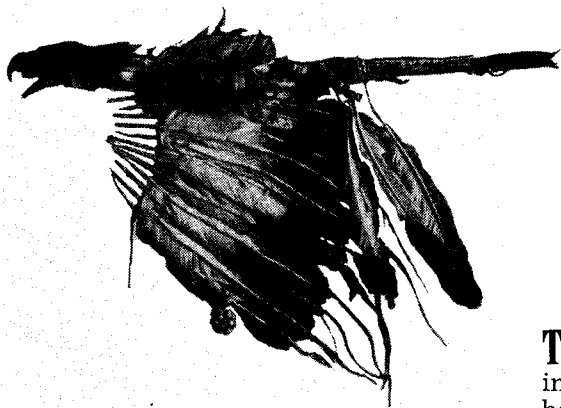
A casual visitor to the Manitoba Museum may well be struck by the fact that the exhibits are not grouped together according to the subject matter. This is due to the fact that the Auditorium was never designed for a Museum. The collections have had to go at once where there happened to be a case to accommodate them; and storage space is almost non-existent, so that some exhibits cannot be stored for periodical exhibition but must be kept in the cases.

Other museums have been very helpful to us when we have called upon them for co-operation and advice; they have also kindly given us free copies of their scientific publications. We are not yet in a position to publish bulletins, but when we do so, we shall gladly reciprocate.

It is hoped that these few pages will be found interesting and instructive, and that the many shortcomings will be treated in the same spirit in which this booklet is tendered.

L. T. S. NORRIS-ELYE, *Director.*

INDIANS



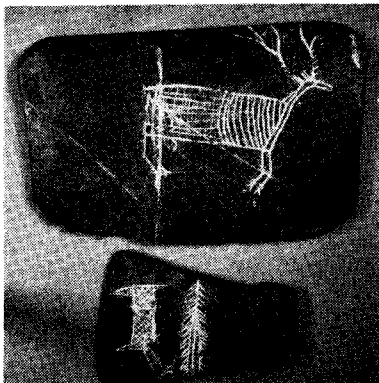
Ceremonial pipe-stem formerly belonging to Kee-a-kee-ka-sa-coo-way ("The man who gives the war-whoop"), Head Chief of all the Assiniboines. Decorated with the head and tail feathers of a golden eagle.

THE STUDY OF THE ABORIGINAL races of the Western hemisphere presents difficulties, many of which may never be over-come. The first white men to make contact with the Indians left few records, and many of these are vague and not very accurate. The Indians and Eskimos themselves left

no written records, apart from a few pictographs (language written pictorially) and signs. Further South of us in Canada the Mayans and Aztecs left more records but these are very much mixed up with tribal traditions and superstitions. There, we can at least look to the early Spanish and Portuguese records.

In Manitoba and in all Northern regions, such records are very rare and have left many questions unanswered. The surviving Indians can tell little apart from legends and usually hesitate to tell us anything at all. Many of the tribes have been driven out of their former territories by other tribes or by white men, and it is to these we must look for their relics. We have to rely largely upon the records of the earliest white explorers and upon the weapons and utensils which remain hidden below the soil or which have been collected and preserved. Fortunately, tradition dies hard and many of these still survive, especially in the various designs and types of workmanship of each individual tribe, thus giving us valuable hints as to their origin and inter-relationships. Languages also help us to establish relationships among the various tribes.

There used to be a cliché among white men that "The only good Indian was a dead Indian." Those who repeat this, do so without any basic knowledge as to what the Indians were like before



Indian banner stones of red pipe stone, with drawings of a Wapiti (upper), and a white-tailed deer and feather (lower).

they had been robbed, cheated and humiliated by the white men. Of course, there were some primitive tribes who could never be trusted, but there were numbers of others who were found to be intelligent, honest and polite by those who first met them. George Catlin lived with dozens of tribes during eight years and speaks very highly of their hospitality and honesty. One could hardly doubt their courage. Their lives were largely guided by an implicit belief in "The Great Spirit" and their legends show how highly poetic their minds were. Anyone can see to-day how artistic they were by viewing some of the beautiful quill-and bead-work made by the various tribes. It is true that some of their habits were not very appetizing to white people, and when roused, they could be just as brutal as any white man. At the present time, many of our Indians are treated as foreigners in their own former territories.

Our chief tribes in Manitoba have been the Sioux, Crees and, in the East, the Chippewa. In former times there were some Indians popularly called "Mound-builders" of whom the present-day Indians seem to know nothing. These were so-called because they made various types of mounds of earth for burials, ceremonials and for defense works. Their centre of culture was in the Mississippi Valley and their Northerly limit seems to have been Southern Manitoba. A few of their relics found in Manitoba are shown on page 7. These people had a culture unlike any known Indians. They mined native copper from the deposits along the South shore of Lake Superior, and further south also mined mica in large sheets. Like the Iroquoian tribes of the South-East, they were agricultural, growing large crops of maize, squashes, etc. These people were constantly subject to attack by the roving, hunting tribes and must have had to build huge stockades for defense. In most districts game would not support a large population even for a few weeks, and when the game migrated or moved to new ground, it would be necessary for the tribes to follow the game. An agricultural tribe could support a large resident population until the



Indian scalp locks attached to head-bands and worn by the braves. LEFT—Locks taken by Crees from Blackfoot Indians. RIGHT—Locks taken by the Blackfoot from the Crees. A scalping knife.



Two war clubs, a tomahawk pipe and what is believed to be an angular club, all from the Pacific Coast.

*Indian relics found in Manitoba
British Columbia
and the Northwest
Territory
from 1870 to 1880
by George Catlin
and others*



Two fine war-eagle bonnets decorated with tail feathers from an immature golden eagle, at the tips of which are discs to hold strands of white horse hair. Sioux Indian.



soil condition made it essential to move to new ground after a period of years. Jenness states that the Iroquois cleared the land by burning and with stone axes. Cultivation was with long digging sticks or hoes fitted with blades of shell. He says that fertilization was understood by very few tribes and rotation of crops by none. He thinks that the cultivation of maize reached Canada and the Northern States from the South where it had been cultivated for long. These tribes built huge granaries for storage of the crops. Squashes were preserved in underground caches. Often large bark chests took the place of granaries. Some idea of the scale of this cultivation may be gained when one realizes that in 1617, Frontenac spent three days in destroying the corn which extended $1\frac{1}{2}$ to 2 leagues from an Indian fort. Perhaps the mound-builders grew their crops on an equally large scale.

Another characteristic of the Mound-builder culture was the coiled pottery with a spiral groove outside carried to the bottom of the vessel. They smoked straight, tubular pipes of the red stone, known as catlinite and made whistles from the wing bones of large birds. They also used many copper implements and some wore copper brow-bands. Some of these are in the Museum. These mounds were usually along the river banks and most of them have been ploughed up long ago. Most of the specimens in the Museum came from mounds near the junction of the Antler and Souris Rivers or from the mound North of Rosser. The nearest known mound to Winnipeg is on the left of the road, about 100 yards North of the Junction of the Henderson Highway with the road over the locks at Lockport. There was said to have been a mound where Fort Garry Court now stands near Broadway and Main Street.

The Indians inhabiting Manitoba in recent times — Sioux, Crees and Chippewa — have left us a very fair collection of material. The Museum has some fine war bonnets and decorated scalp locks from the Sioux. The war bonnets were made of cloth decorated with the tail feathers of immature golden eagles, often with tufts of horsehair attached to the tip of each feather. The feathers were allowed by the councils as rewards for brave deeds. Probably our phrase "A feather in his cap" is derived from this Indian custom. The illustrations show two sets of scalp locks; those on the left were taken by the Crees from the ~~Sioux~~ ^{Blackfeet}, but the ~~Sioux~~ ^{Blackfeet} politely returned the call and took those on the right from the Crees. Several of the Plains Indians used to shave the hair of the head, leaving the "rose" on the crown to grow a pig-tail in order to defy their enemies to take the scalp. The rose produced with a scalp proved to the council that only one scalp had been taken and therefore it had special merit; otherwise one scalp cut in pieces might support a claim for several scalps. Dr. Leechman of the National Museum does not believe that this shaving took place among the Plains Indians until the advent of the white man with his superior cutting implements of metal. Facial hairs were plucked out with clam shells. Those shown in the illustrations were worn attached by a brow-band round the forehead. Parts of scalps were often attached to shirts and the sides of leggings, several of which may be seen in the Museum.

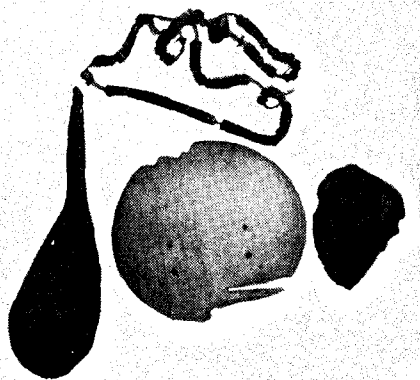
The Museum has rather a large collection of Indian pipes, many of them very ornamental and showing the finest workmanship, including inlay work. Some of the pipe stems were made without appropriate pipes and the stems played an important part in some of the solemn ceremonies. The pipe-stem carrier was a very important individual and had to be wealthy as he paid his predecessor handsomely for the privilege. A very fine pipe-stem, of which the pipe has been lost, is shown on page 4. This belonged to Kee-a-kee-ka-sa-coo-way (the man who gives the war-whoop), the Head chief of all the Assiniboines. Paul Kane, the Canadian Artist, painted his portrait, in which he holds this stem.

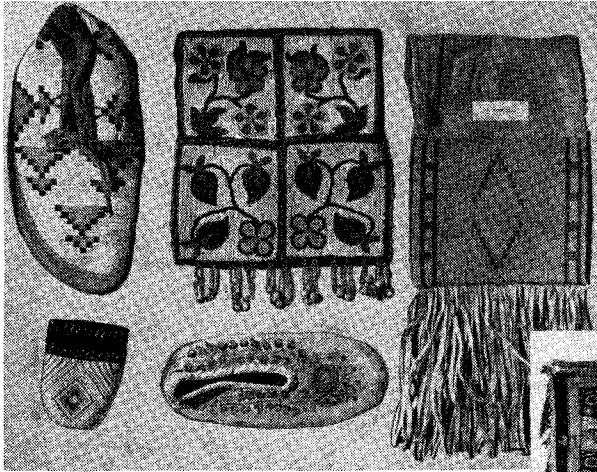
The Indians were much given to ceremonies, most of which were attended only by the adult males.

Among other things carried at these ceremonies were what are called banner stones — stone images or stones with designs on

BELOW—From a Manitoba Mound-builder's grave, whistles made from wing bones, tanning tools of bone, and a broken arrow-straightener.

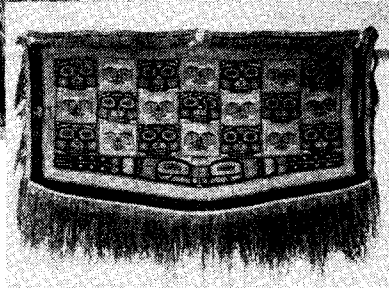
RIGHT—From another Manitoba Mound-builder's grave. Wampum made from shell and threaded; a spoon made of horn, a shell gorget worn on the chest suspended from the neck; and a piece of typical pottery with its characteristic coiled groove.





Indian handicrafts. TOP — Bead-work moccasin, apron and pocket. BOTTOM — A porcupine quill-work pouch and a moccasin of buck-skin with fibre silkwork.

BELOW — A blanket made of ~~dog's hair from dogs~~ kept for the purpose. From N.W. Vancouver Island.



Chilcat (goat)

them usually attached to finely-decorated sticks. In the Museum are several such stones, some like toy ducks, otters, etc., and some with designs scratched on the soft stone. Those illustrated are of catlinite, one showing a good picture of a wapiti and the other of a deer with the "flag" or tail raised, indicating alarm, together with a feather or the butt end of an arrow. These would probably be considered as likely to give good luck in hunting such animals.

The war and hunting weapons of the various tribes differed somewhat in detail, but were of the same general type. These included the bow and arrow, the spear and the war club. The tomahawk and scalping knife were important items also.

The Museum has a fine collection of early Indian material collected by Paul Kane during his journey from Toronto to Victoria and back (from 1845 to 1848). These include some Pacific Coast items including the two wooden war clubs and the tomahawk pipe shown in the illustration. The other implement has not been identified yet for certain. Another item in the same collection is a very fine dog-wool blanket from Vancouver Island and which is illustrated. These semi-naked tribes needed warm blankets during cold weather, but mountain goats did not occur on the Island; they bred a small brown and white dog for the sake of the hair and Kane had to pay a lot for this item a hundred years ago. He also brought back an Eskimo rain coat made from strips of a sea mammal's intestines — whale, sea lion or seal.

W. H. Rand has for years collected, and is still collecting, a lot of very valuable Indian material in Manitoba and Saskatchewan, practically all of which he has donated to the Museum. In addition, he has investigated and reported upon various ceremonial grounds, and has inspired others with great enthusiasm for this valuable form of research.

ESKIMOS

THE MUSEUM HAS A GOOD COLLECTION of Eskimo effects, many of which have been loaned by Archdeacon Marsh who collected them in the region of Eskimo Point, N.W.T. A few of these are illustrated. The woman's beaded coat is a very fine piece of work and the lowest fringe in front contains many caribou teeth. We have some decorated with musk ox teeth. This is Padlemuit work.

The Eskimos have men's knives and women's knives; the men's are short and stubby, the women's are half-moon-shaped as shown in the illustration. In the same group are two different hair sticks. The women used to wear these by tying a lock of hair under the wrapping and letting the stick hang just in front of the ears. Some distance from the coast is a tribe in which the men occasionally wore these sticks. They are said to have almost gone out of fashion now.

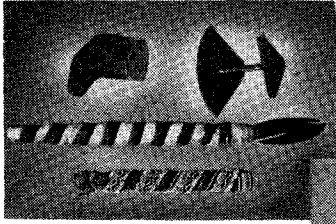
These people are very skilful with their hands and use an ingenious drill as illustrated. The small piece of wood at the top has a hole in the lower surface into which the point of the pencil-like rod fits. The small piece is gripped between the teeth and pressed downwards while the rawhide bow-string is moved back and forth to rotate and reverse the pointed iron drill at the bottom of the rod. Thus only one hand is required for the bow, leaving the other hand free to hold and adjust the object being drilled. In the same group may be seen two wooden tops, the pin and hole game, nooglotuk (in which the bone is suspended and allowed to rotate and the man betting has to push a tiny spear point through the small hole as it turns round). At the extreme right is a "whirler," a disc of rawhide with a sinew thread through the centre which is spun round at the end of the thread to make a noise. Several



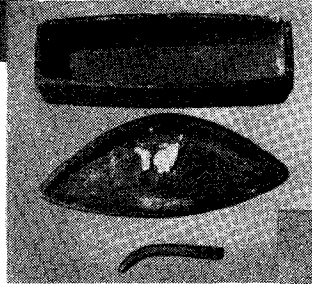
A fine Padlemuit Eskimo woman's coat of caribou skin, decorated with glass beads and, on the fringe, caribou teeth.



An Eskimo raincoat and cap made from strips of the intestines of a whale or seal. The skirt covered the well of the kayak.

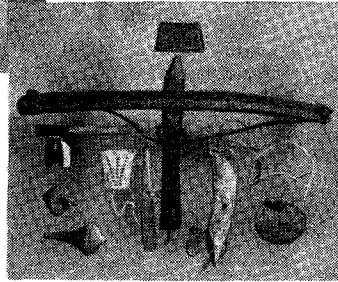


ABOVE — Eskimo knives; left, a man's; right, a woman's. Lower, two women's hair-sticks worn like ear-rings but suspended from hair locks.



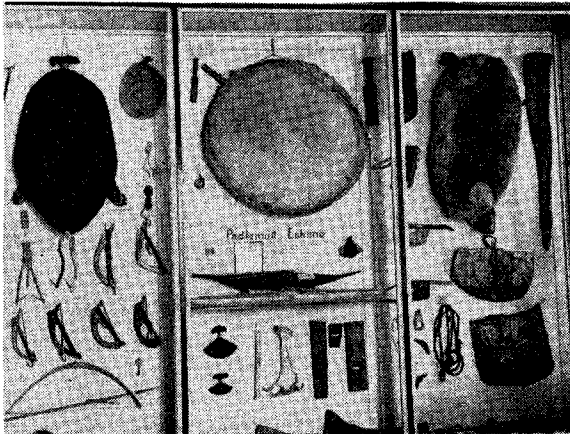
CENTRE — Padlemuit Eskimo utensils. From the top: a stone cooking pot, a stone lamp with real seal fat and a wick of tundra moss, and a stone wick-tender to adjust wick and prevent smoking.

RIGHT—Eskimo drill and mouth-piece for holding drill. From the left, two wooden tops; the hole and pin game; the game of nooglatook; and a whirler to make a noise, of rawhide and sinew.



Asiatic and early European peoples had similar amusements. The photo also includes a typical Eskimo pipe.

Eskimo heating and cooking utensils, while primitive, are wonderfully efficient and reliable and are made of soapstone — a soft and easily shaped stone. The crescent-shaped vessel is the lamp with real seal fat on it and also some moss for a wick gathered by the Eskimos; the stone rod is the "wick tender" to adjust the moss, especially if it smokes. These lamps will boil water in the large stone pot for cooking meat or making soup and will warm the igloo somewhat and, when well tended, give enough light to allow one to read.

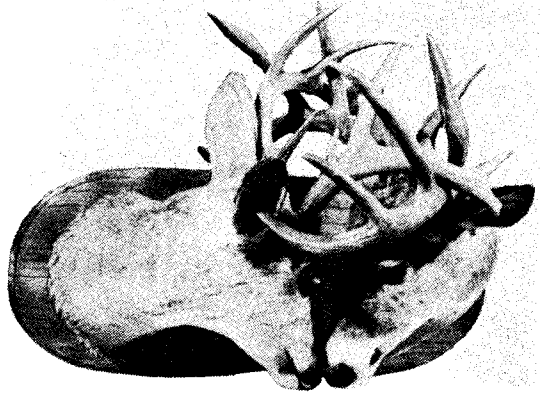


A small part of the collection of Rev. D. B. Marsh, Eskimo Point, N.W.T. Large objects, from left, a harpoon float of seal skin, a drum, and a bag, both of caribou skin. Lower, Left Section — a fish spear, fishing lines on stretchers, baits, a bow and arrow. Centre Section — a model kyak, women's knives, a drill, a sleigh anchor of caribou antler, mud planes used on sleigh runners. Right Section — a skin water pail, a man's game bag, dippers.

ZOOLOGY

THE MUSEUM IS GRADUALLY accumulating a good collection of certain groups in zoology. The mammal collection, especially of the smaller species, has been considerably enlarged during the last few years, though there are still many gaps. To collect these involved continuous field work, though some mammals that have been sent by mail or by express have been saved. These must be skinned at once or they will decompose quickly. The larger mammals are represented by full mounts of the whole animal, such as the bison, timber wolf, coyote and musk ox. Other specimens include heads of moose, deer, sheep and polar and black bear. Many of the smaller mammals have been mounted fully, but lack of space and funds preclude any additions of full mounts of any but the smaller varieties. In addition there are several scientific study skins of small mammals, including the appropriate skulls.

In the mammal section are instances of accidents to wild deer; in one of these, two bucks, charging head on, sprung the antlers apart momentarily and became firmly inter-locked. Other cases (not illustrated) are of a deer's foot caught in a snare made of wire, which was partly over-grown by new bone formations, no doubt causing intense agony. Still another case is of a deer that stepped into the aperture of an atlas bone (first vertebra) of a cow and was very lame in consequence; it was shot by a hunter.



White-tailed deer heads with inter-locked antlers, mounted as they were found. They had died from exhaustion shortly before being discovered.



A habitat group of Richardson ground squirrels, made by the Museum technician, showing the animal's home and surroundings.



A habitat group showing the home of the short-tailed shrew. The toadstool, bark, etc., had to be made by the technician.

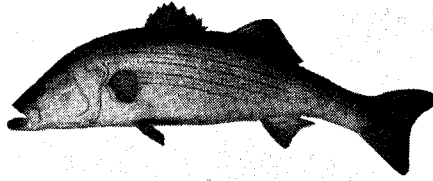
There are a few dioramas made by Angus Shortt, the well known Canadian bird artist. Two of these are shown. One is of a pair of Richardson ground squirrels (wrongly called "gophers") showing the type of burrow and country they inhabit. The wild rose in the case was made by Mr. Shortt, who also painted the background. The other is of a short-tailed shrew; the leaves, toadstools and tree trunk were also made by Mr. Shortt.



Part of a case of mounted Manitoba owls, showing in lower left corner some "pellets" ejected from the beak of a snowy owl.

The Museum has several hundred birds, five cases contain full mounts, and there are also several study skins for demonstration or for students. In addition, the Museum owns a very fine collection of birds collected by the late C. G. Harrold. This collection will at last become available to students because proper Museum cases are going to be provided to house the study skins. The Museum is also fortunate in having three

passenger pigeons, and a Heath hen, all of which are extinct. Other rare birds include three specimens, fully mounted, of the Whooping crane. Two of the passenger pigeons may be seen in the illustration on the extreme right, with one gull below them and a humming bird above. Another illustration shows part of a case which contains a specimen of each kind of owl found in Manitoba, except the barn owl which scarcely ever occurs in this Province.



A striped sea bass from the Atlantic. Made in plaster from the original fish (see text).

The large eagle in flight is a beautiful mount by Mr. Shortt, and the tail feathers, having white in them, show that it is an immature, as adults have an entirely dark tail. Since the photographs were taken, an adult bald eagle has been added to the collection and is near the golden eagle in the West gallery downstairs.

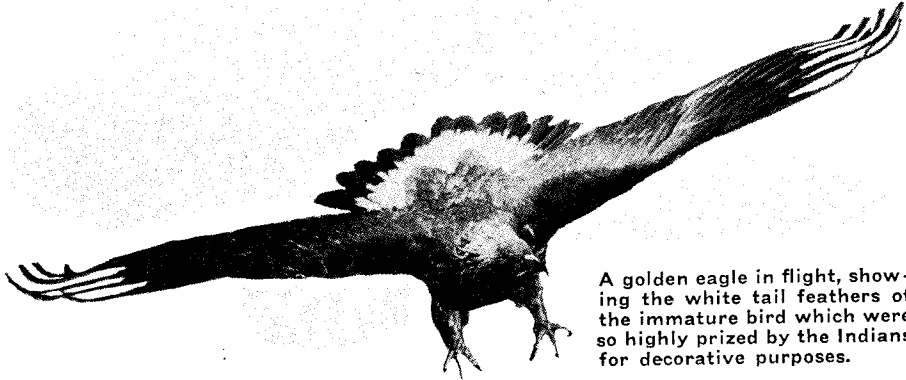
The museum also has a fair collection of toads, frogs, etc., and reptiles but these have not been illustrated. There is a small collection of fish, most of which were prepared by A. Shortt and R. Sutton. The one illustrated is of a striped sea bass (Atlantic). As in most museums nowadays, these are mounted as plaster casts, made from the original fish

Part of a case of mounted birds. Extreme right, near top, are extinct passenger pigeons and a mourning dove. Just above them, is a ruby-throated hummingbird near its tiny nest. Below them, on the floor, are two species of loons. The bird in flight just above the loons is a parasitic jaeger in the dark phase.



with artificial fins and then expertly painted. They are permanent and are almost indistinguishable from the real thing.

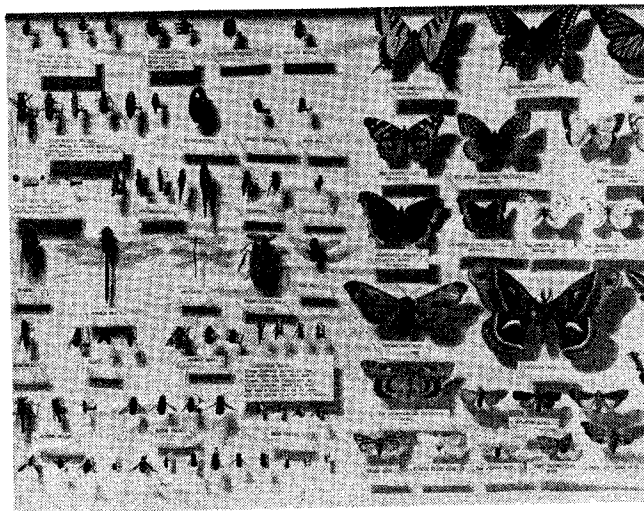
Among the invertebrates (animals without a backbone), the largest collections are of butterflies and moths. A few of these are displayed on the walls, together with a few representative specimens of several orders



A golden eagle in flight, showing the white tail feathers of the immature bird which were so highly prized by the Indians for decorative purposes.

of insects, but the main collections have been neatly and scientifically arranged in cabinets by G. Shirley Brooks over a period of years, and there is now a fine collection of Manitoba Moths and Butterflies available to serious students and others interested.

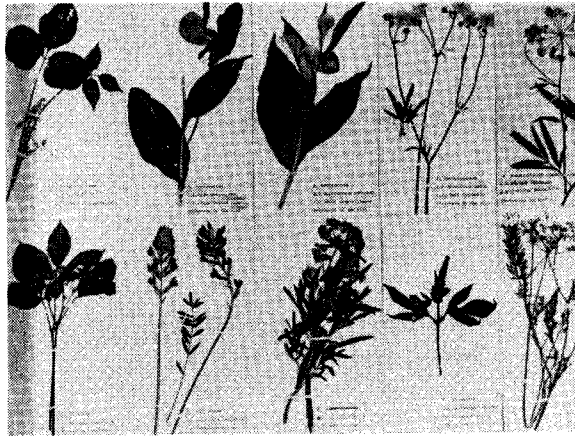
In addition to these, the Museum owns a large collection of very spectacular moths and butterflies from all the continents. This collection represents the life work of a Winnipeg man, C. E. Wallin, who worked for the C.P.R. and collected through the mails from friends and other correspondents. Besides the moths and butterflies is a growing collection of dragonflies, beetles and some other orders of insects.



A wall case showing representatives of most of the orders of insects found in the Province.

BOTANY

THE FINE COLLECTION of Manitoba plants is well worth seeing. From the international border to the Arctic tundra, this Province can show an enormous number of species. This collection has been gathered together, mounted and labelled chiefly by Professor Lowe and Mrs. A. Simpson. It would surprise many people to see the beauty and large variety of the flowers which have come from



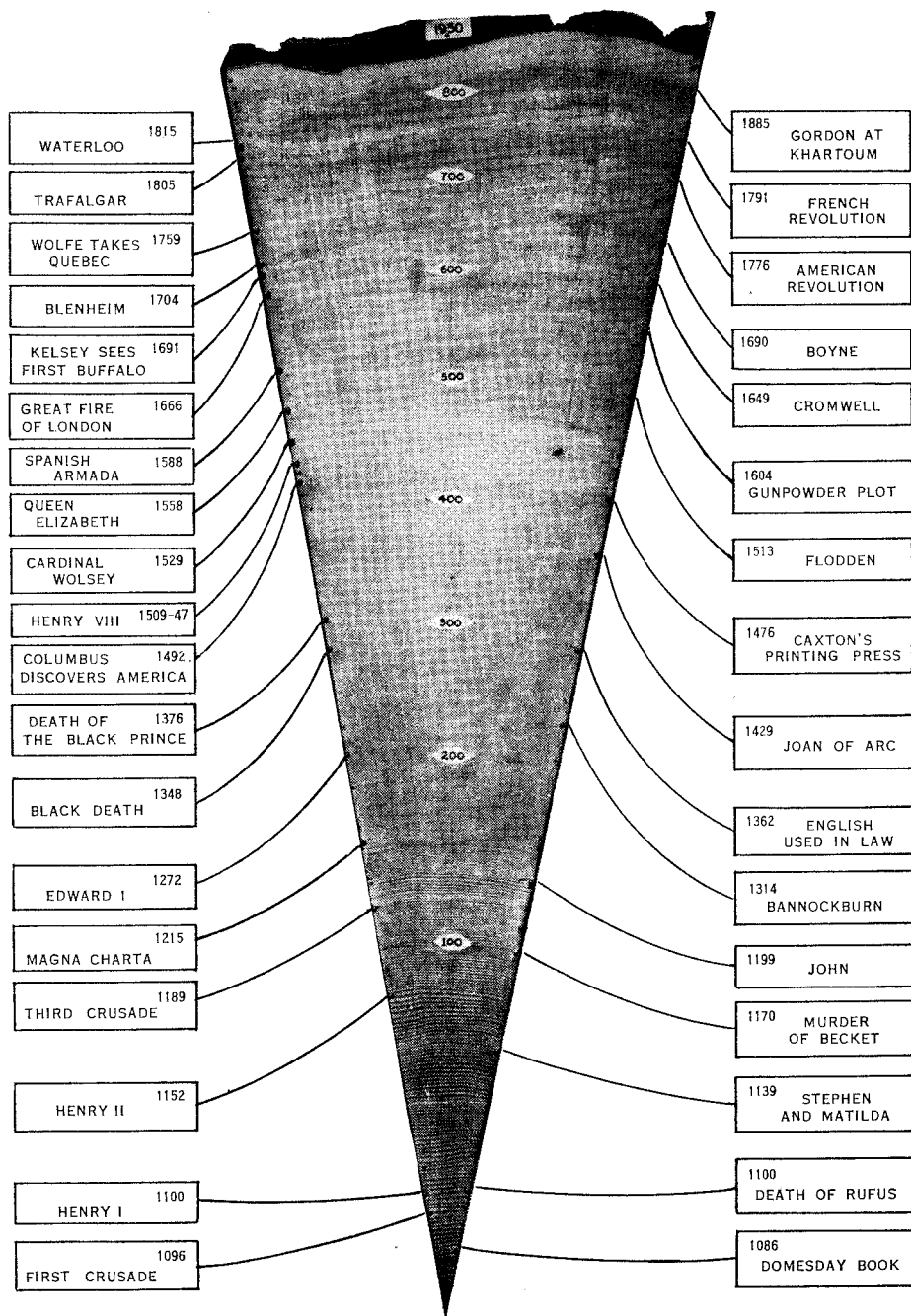
A small selection from the large collection of pressed plants. This shows some of the poisonous plants. Mounted for a special display.

the "bare" tundras of the North. The collection contains specimens of ferns and liverworts, as well as the flowering plants. Up to the present, it has not been possible to add many specimens of the fungi. The illustration shows how the specimens are mounted.

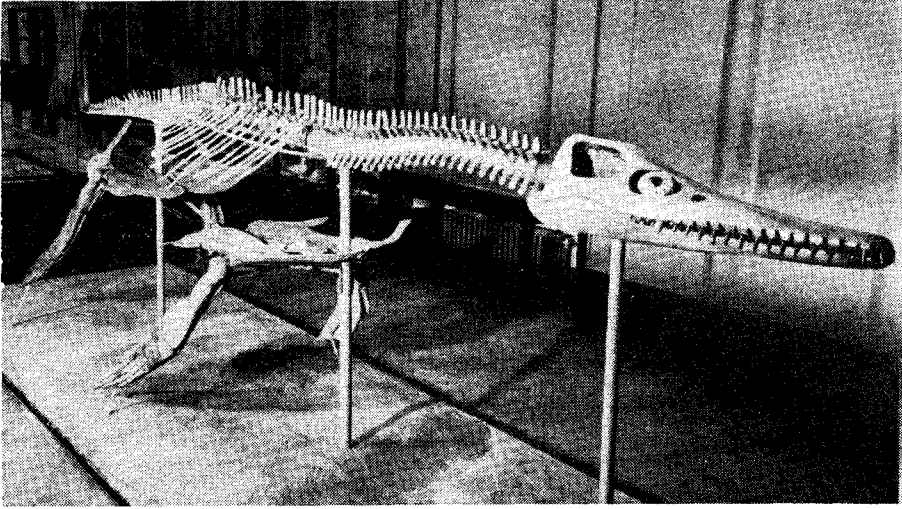
The illustration on the next page is of a small section of a Western red cedar from the Pacific coast and shows the annual growth rings. The dark rings are the winter growth and the wider paler rings are the summer growth. By counting the number of winter (or summer) rings, the age of the tree is determined. This tree was 864 years old. Pins have been inserted into various rings, and from each pin a thread leads to a label, mentioning the date and an historical event of that year.

This tree is by no means the oldest found in B.C. The Douglas fir sometimes attains an age of 2000 to 2500 years. The giant redwood of California is said to reach 3000 years. The system of determination of the ages of trees by counting growth rings received a rude shock a few years ago. It was found in the Western States that some trees could add four or five rings during a year. During a period of drought, slight growth would add a small ring, but a few days of heavy rain would induce further growth, forming a wider and lighter ring. It is not believed that this happens in the higher latitudes of Canada. Reading of growth rings has enabled botanists to determine periods of drought and flood conditions back into the dim past. They can connect up a series of rings in our most ancient living trees with the same series in fossilized trees, and from the fossil wood to earlier fossil wood.

Those interested in botany will be glad to know that a new checklist of the plants of Manitoba has just been published by Professor Lowe of the University of Manitoba, to whom application should be made for copies while they are still available.



A section from centre to bark of a Western Red Cedar, 864 years old. Annual growth rings with labels showing certain rings growing when various historical events were taking place.

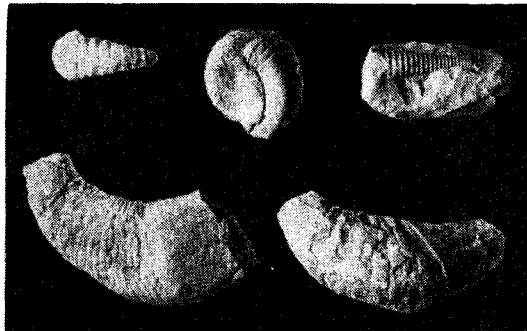


A mounted skeleton of an almost complete plesiosaur found at Treherne, Manitoba. The artificial head was made from an actual specimen in Kansas City. This was a great sea reptile (not a dinosaur) inhabiting the Cretaceous seas of Manitoba some fifty-five million years ago.

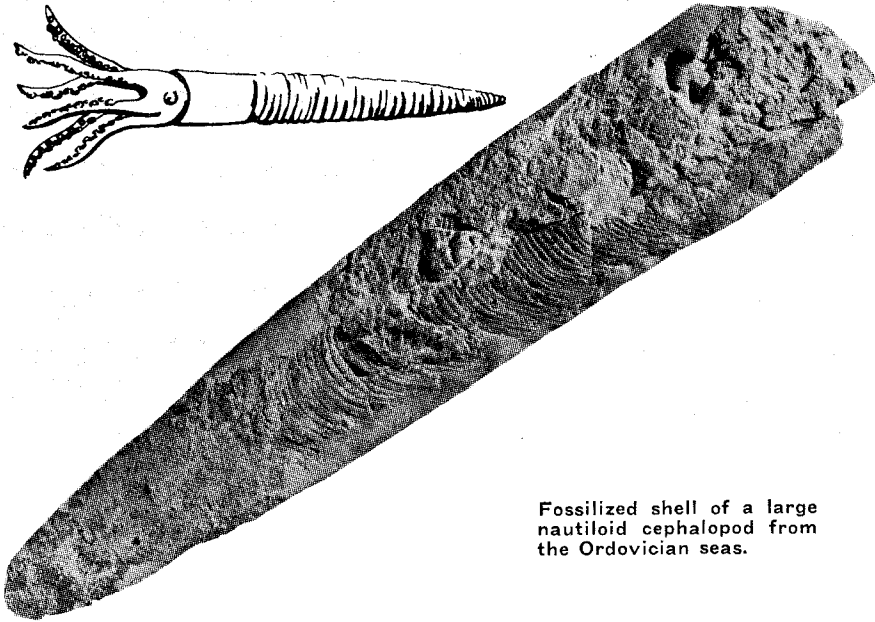
FOSSILS

MOST PEOPLE ARE INQUISITIVE ENOUGH TO WONDER WHAT THIS part of the country was like in the dim past, and what sorts of animals and plants existed. Many of these questions are easily answered by visiting a Museum in almost any large city. Nature has been very kind in preserving, with varying degrees of perfection, a very great number of specimens of animals and plants which lived in Manitoba and other regions many millions of years ago. In speaking of the geologic ages, the time lapses are far too great to speak of them in terms of thousands of years; one must get used to millions and hundreds of millions of years. We have to adapt our units of measurement to the subject under discussion; we would not measure the distance from Winnipeg to Moscow in inches.

In the Museum are fine specimens of animals and plants which have been preserved in stone for hundreds of millions of years and which lived in the great



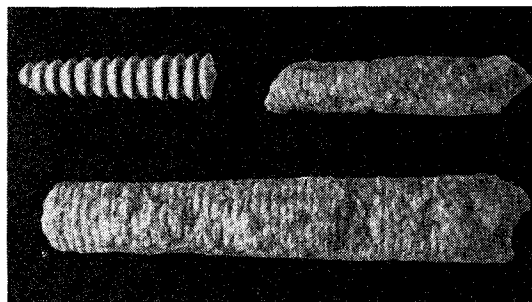
Fossilized shells of nautiloid cephalopods (ancestors of the squid and octopus) which lived in the Ordovician seas of Manitoba two hundred and seventy-five million years ago.



Fossilized shell of a large nautiloid cephalopod from the Ordovician seas.

seas which invaded our Province from time to time. Generally, though not always, it was only the hard parts that were preserved, such as bones, shells, etc. As the animals perished, they sank to the sea bottom, where they became covered with fine deposits of lime or other mineral substances. In the course of millions of years, these remains became buried under deposits thousands of feet thick. After the sea had gone away, many of these same deposits were worn down by weather and other agencies, to leave the fossils at or near our present surface where we find them. Now, they are no longer true bone or shell, as those materials have usually been dissolved out and replaced by particles of minerals such as lime. They are therefore images in stone of the original. Other fossils may be merely foot prints in the original mud since turned to stone, or even the actual animal imprisoned in tree gums changed to amber, of which there is a specimen in the mineral room.

Our first photograph shows the fossilized skeleton of a huge sea reptile (not a dinosaur) known as a plesiosaur which was found near Treherne. Parts of other plesiosaurs have been found in the same deposits since this one was



A few more Ordovician nautiloid cephalopods of a different type.

discovered. About 55 million years ago these animals inhabited the Manitoba seas the last time the ocean invaded our Province. The Museum also has parts of a somewhat similar reptile called a mosasaur. From similar deposits in the Province we have some beautifully preserved sharks' teeth. During this same period the dinosaurs were abundant in the higher lands of Alberta where the tropical fresh water swamps were to their liking. They did not exist in Manitoba.

The other photographs are of a few specimens of fossilized shells of some of the ancestors of our present-day squid and octopus. These inhabited a sea which invaded our Province in a period known as the Ordovician. As these remains are late Ordovician, they take us back about two hundred and seventy million years ago when even the fishes had no true bony structure and no land animals at all are known to have existed.

Great lime deposits may be seen at the quarries at Garson, East of Winnipeg. Many of the largest buildings in Winnipeg are built of this limestone, such as the Legislative Building, the Auditorium, the Hudson's Bay store and the Federal Building. Look at the walls and see some of these ordovician fossils exposed on the surface of the stone.

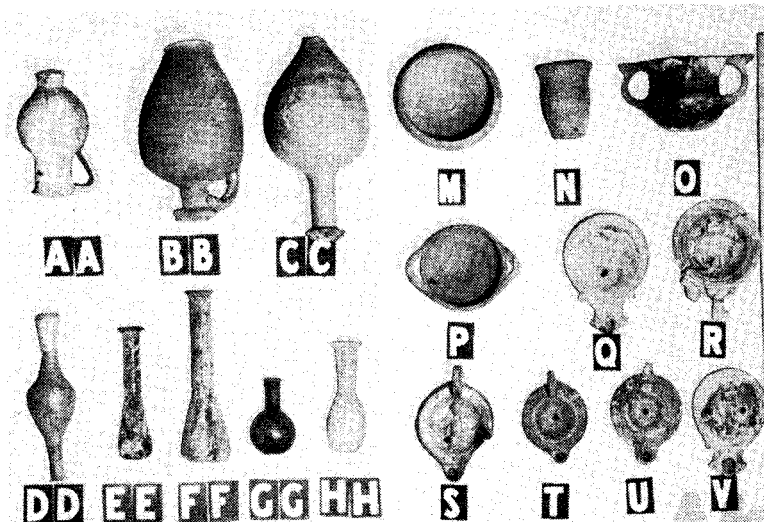
These ancestors of the octopus go by the imposing name of nautiloid cephalopods, which merely means that they had bulk-head compartments inside the shell like the well-known present-day nautilus, and that the legs were appendages of the head and not of the body. The animals were prisoners in the shell, being attached to it by a tube which ran from the rear end of the soft body through all the internal bulk-heads or dividing walls, which are called the septa. The inside of the shell was filled with a gas or gasses. They crawled along the sea bottom carrying the shell and probably feeding chiefly upon carrion. Elsewhere, some of these have been found over 10 feet long.

As the Museum has specimens of a modern squid and octopus and also of a nautilus, visitors can easily visualize what the animal and its shell looked like in the case of these early ancestors. There are many other kinds of fossils in the Museum, including several kinds of Manitoba corals, sea snails, primitive fishes, etc.

THE PHOTOGRAPHS

The habitat group of the Richardson Ground Squirrels, and the sea bass, were taken by Angus Shortt; the Virginia deer with interlocked antlers by W. H. Rand; the Golden Eagle, the section of Western Red Cedar and the plesiosaur by Jos. McNab; and the nautiloid cephalopod by E. I. Leith. The rest were taken by the Director.

OLD WORLD CULTURES



AA to CC — Egyptian terra cotta pot and jars.
 DD to GG — Egyptian glass tear bottles to collect
 the tears of guests at funerals. HH is said to be
 a Greek ~~tea~~ bottle, of terra cotta. Roman pottery,
 including six lamps.

CANADA IS NOT AN IDEAL SPOT AT WHICH TO AMASS A COLLECTION of antiquities of Old World cultures. The Manitoba Museum rarely has an opportunity of getting such material. Further, there is not room for objects from our own Province in the present limited quarters.

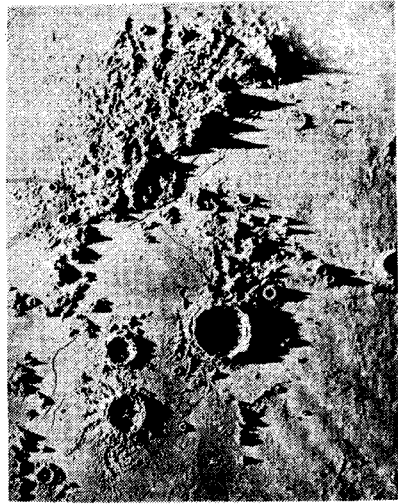
The Museum has a very small collection of Egyptian glass tear bottles and a few other interesting items such as clay tablets with cunieform writing on them going back to 2500 B.C. A few of these have been translated. There are also some Greek and Roman oil lamps of pottery, terra cotta bottles and jars, some of which have been approximately dated by an expert authority. ~~The tear bottles were used at funerals by attendants who collected the tears of relatives and guests, after which the bottles were sealed and laid in the tomb.~~

The Museum also has a collection of very early European flint-work implements, chiefly from the caves in France. These are arranged in chronological order from the very primitive to those of the highest workmanship. As experts in flaking, the later workmen were probably never equalled. In this collection is some of the gravel from which the famous Piltown man was taken; this was in Sussex, England. These implements are of particular interest when compared with those of the Indians. The methods used in flaking were fundamentally the same in Europe and Canada—first striking the stone with a suitable instrument to fracture it, followed, in Neolithic work, by pressure flaking with a bone implement. Polishing with a hard stone was sometimes resorted to in advanced cultures.

ASTRONOMY

CLASSES IN ASTRONOMY ARE given in the Museum and illustrated by a large demonstration case given some years ago. This case contains fifty large photographic transparencies obtained from the largest observatories—those at Mount Wilson in California, and at Victoria on Vancouver Island. These fine photographs are illuminated from the rear by electric lights. The subjects are of great variety and of much interest and include the planets, eclipses of the sun, sun-spots, several of the moon and many nebulae and comets. Instructive labels accompany each photograph and these are in simple language.

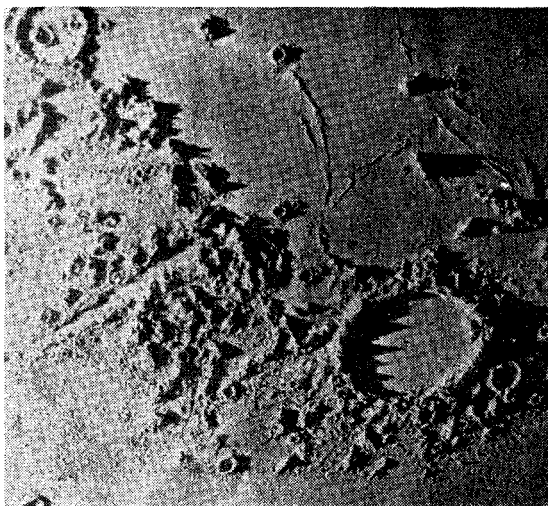
Although few people seem to know anything worth while about Astronomy, it happens to be about the easiest subject in which to arouse keen interest. Most people only look toward the sky to see if it is cloudy, without finding out what a number of thrilling objects there are in outer space. Yet, if it were possible to offer a safe journey to the moon



The Apennine range of mountains on the moon, 400 miles long. The large crater is Archimedes and is 50 miles in diameter, over four times the diameter of any crater on the Earth. Some of the mountains are over 20,000 feet high.



Three craters on the moon classed as walled plains. **LOWER**—Theophilus, 64 miles across and 5,200 feet deep. **CENTRE**—Cyrillus, 60 miles in diameter with a central mountain cone 5,800 feet high. **TOP**—Catharina, 65 miles across and 13,000 feet from rampart to floor.



The Alps, on the moon, 130 miles long with many peaks up to 10,000 feet and a valley 70 miles long and five miles wide. The huge crater, Plato, is 70 miles long and its rampart rises from 4,000 to 8,000 feet above the floor.

or to one of the planets, there must be few who would not be anxious to go. Without such a journey, it is possible to see a very large number of magnificent objects on our nearest neighbour, the moon.

Three photographs have been selected to show how thrilling the study of the moon can be, but before discussing these, it is necessary to state a few facts about the moon itself. Its diameter is only 2160 miles, as compared with the Earth's diameter of 7912. Its illumination is entirely due to reflected

sun-light, as is also the case with all planets. It is only an average of 238,000 miles from us, while the sun averages about 92 million miles. We see only one side of the moon because, as it goes round the Earth in just under $28\frac{1}{3}$ days, it spins once on its axis in exactly the same period. Objects on the moon would weigh one-sixth of their weight on Earth; so a man would be able to jump six times as high.

On the moon there is no air, no water, no sound and almost certainly no life as we understand the term. On the lighted portions the temperature is far above that of boiling water, and on the dark side much colder than any parts of the Earth. The shadows caused by mountains are inky black and at sunset reach over a hundred miles in some cases. Without an atmosphere to filter out some of the sun's intense rays, the light is dazzling. The absence of air also means that meteors strike the surface at their full velocities of from 18 to over 60 miles per second (from 36 to 120 times the speed of rifle bullets). On Earth, the friction through the air burns up all but a very few before they reach us.

Over 30,000 craters have been described, some of them from 50 to 100 miles across and up to 16,000 feet deep. Some of the mountains are over 20,000 feet high. On a clear night, when the moon is a crescent, many craters can be seen with a small hand telescope or even with good field glasses. Through an astronomical telescope, the sight is awe-inspiring. The photographs show what a good telescope will disclose.

Our first photograph shows the crater Archimedes (diameter 50 miles), to its left Autolycus (23 m) and Aristillus (34 m). The rampart of Archimedes averages 4300 feet in height but parts of it are much higher. Above the three craters is the great Apennine Range, 400 miles long with mountain peaks over 20,000 feet high. Note the shadows of these great peaks.

Also note the illuminated peaks of mountains rising from the centres of two of the craters themselves. The cracks in the surface run for hundreds of miles, even through the craters without interruption, and they are at least a mile wide and of unknown depth. Many of the small peaks on the plain are a few thousand feet high. The smallest visible craters are over a mile in diameter. The largest crater on the Earth is about 12 miles across and is part of a famous game reserve in Africa.

The next photograph is of three craters so huge that they are classed as walled plains. The top one, Catharina, is 65 miles in diameter and is 13,000 feet from rampart to floor. It has numbers of smaller craters formed later on its floor. The middle crater is Cyrillus and is 60 miles in diameter with a central cone rising 5800 feet from the floor. The rim is 15,000 feet above the floor. The lower crater is Theophilus and is 64 miles across with a central cone of 5200 feet high and a rampart 5200 feet high. As this over-laps the central crater, it must have been formed last.

The last illustration is of a magnificent crater, Plato, which is 70 miles along its greatest axis, with a rampart 6 miles wide in places, and varying from 4000 to 8000 feet in height with some very fine mountain peaks of which the shadows give some indication of the shapes and steep slopes. Between Plato and Cassini (the crater in the top left corner) are seen the Alps, a mountain range that extends for 130 miles. The flat channel through the Alps is known as the Valley of the Alps and is 80 miles long and 5 miles wide. On each side of this valley are many mountains up to 10,000 feet in altitude. No reasonable theory has been offered to account for the formation of this valley. It is nothing like as smooth as it looks, as anything under about a half a mile across would not show. If you will look immediately above Plato, you will see a lone mountain, Pico, on the plain. This mountain is 8000 feet high; again, note its shape from the shadow.

Of the three views shown in this brochure, I think that this last picture is my favourite. I have seen it dozens of times through my astronomical telescope that I constructed some years ago. It looked very much the same as shown in the photograph, but when seen through a telescope the illumination is dazzling and the shadows are jet black.

It is hoped that this very brief description of a small part of the moon may be the means of stimulating some interest in this grand science and may also induce some people to pay a visit to the Museum where they can learn a great deal more by studying the astronomical display in the main gallery upstairs.

It is quite unnecessary for anyone to be a good mathematician in order to study Astronomy, though a knowledge of higher mathematics is essential for anyone working professionally on the staff of an observatory.

There is a widespread confusion as to the study of Astronomy and Astrology. Astronomy is a science of the highest order and has contributed some of the greatest human intellectual achievements. Astrology is in no sense a science and has been discarded by scientists for at least 200 years. It consists largely of attempts to forecast the future, based upon an elementary knowledge of Astronomy. In short, it is fortune telling.

FAUNA AND FLORA

Partial list of the species and sub-species identified within the Province

ANIMAL KINGDOM

VERTEBRATES		INVERTEBRATES	
Mammals	106	Dragon flies	69
Birds	289	Grasshoppers	97
Reptiles (Snakes, turtles, etc.)	7	Moths	1,100
Amphibians (Frogs, etc.)	11	Butterflies	170
Fishes. Native fresh and brackish water only	77	Beetles	2,400

PLANT KINGDOM

Flowering plants (Monocotyledons)	409	Ferns, horse-tails, club mosses	49
Flowering plants (Dicotyledons)	1,050	Mosses, liverworts	62
Cone-bearing plants	13	Fungi (Toadstools, yeasts, bacteria)	2,000

It is hoped that residents of the Province finding specimens that appear to be unusual, will send them in as soon as possible either to the Museum or to the Departments of Zoology or Botany of the University of Manitoba. In this way, many species, new to the Province may be identified. When forwarding, be sure to give the exact locality and date when found, the name and address of the sender and any details that may help in making full, permanent records. Material from the extreme East and North-East and North-West parts of the Province is exceptionally valuable, as very little work has been done in these regions.

LAKE AGASSIZ

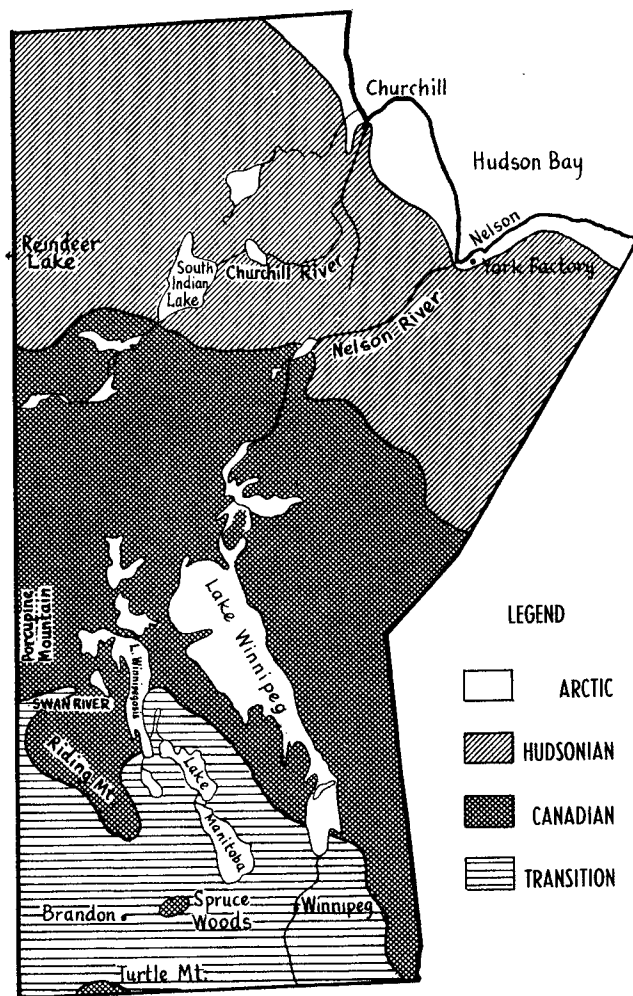
(see map on outside back cover)

THIS FRESH WATER LAKE WAS MUCH THE LARGEST OF THE LAKES FORMED in the neighborhood of the prairies from the melting of glacial ice during the last glacial period, which left these latitudes some 15,000 years ago. There were at least four glacial periods on this continent, each one separated by many hundreds of thousands of years of mild to tropical climatic periods.

The last glacial period consisted of several separate systems, and that in which we are particularly interested had its centre West of Hudson's Bay, where the ice was about two miles in height. At Winnipeg it was probably about a mile and a half high. This enormous mass of ice was compelled to flow in all directions from its centre, just as the comparatively small mountain glaciers today flow slowly down the valleys. Near Winnipeg its direction of flow was almost South. No obstruction could stand in its way; it broke up and carried South many thousands of feet of solid rock and entirely removed many of the more recent limestone deposits, grinding them to flour-like powder, which we see today as our prairie clay.

In this way vast depressions were gouged out of the solid rock, forming the large lakes in our Province, the Lake of the Woods, and, further to the East, under another glacial system, all the Great Lakes. As the climate got warmer, the ice was melted faster than it could move South, so that the southerly ice field gradually receded to the North. As the water wanted to flow North, something like a mile in depth of fresh water was backed up against the southerly face of the ice field. A little of this water remained to form Lake Agassiz, and what remains of that lake now consists chiefly of Lake Winnipeg, Lake Manitoba, the Lake of the Woods, and thousands of smaller lakes.

FAUNAL ZONES OF MANITOBA



ARCTIC ZONE

Mammals — Continental Arctic Fox, White tundra wolf, Hudson Bay Arctic hare. *Birds* — Ptarmigan, Lapland longspur, Eider ducks. *Trees, etc.* — Arctic willows, Dwarf birch, White heather.

HUDSONIAN ZONE

Mammals — Richardson weasel, Wolverine, Yellow-cheeked vole. *Birds* — Fox sparrow, Northern shrike, White-crowned sparrow. *Trees, etc.* — Black spruce dominant over white; absence of jack pine and balsam fir.

CANADIAN ZONE

Mammals—Water shrew. Black bear, Moose. *Birds*—Hermit Thrush, Canada jay, White-throated sparrow. *Trees, etc.*—White spruce, Jack pine, Tamarack.

TRANSITION ZONE

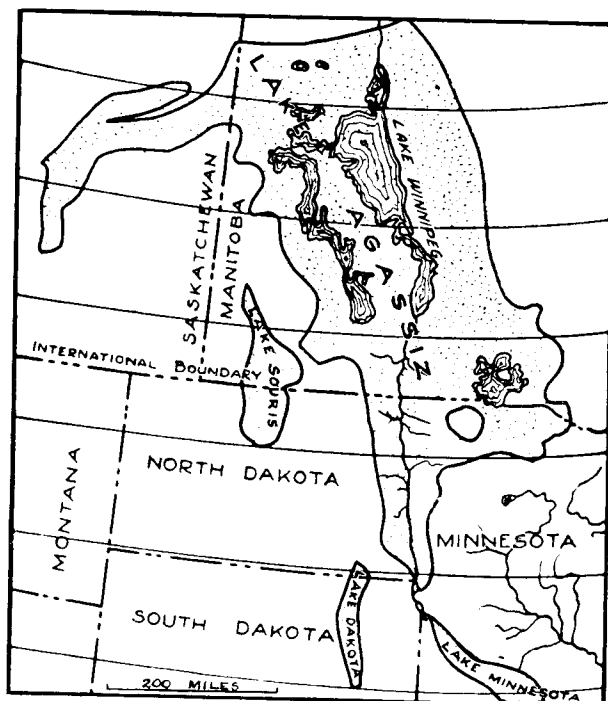
Mammals — Long-tailed weasel, Badger, Richardson ground squirrel. *Birds* — Baltimore oriole, Catbird, Brown thrasher. *Trees, etc.* — Aspen poplar, White elm, Bur oak.

There are four faunal zones in Manitoba, with possibly a fifth in the extreme South-West corner which suggests the Upper Austral.

Most of these zones are fairly easy to recognize from the prevalent trees and shrubs. The Hudsonian zone is not at all easy to recognize, due to its similarity to the Canadian zone; it is really a gradual link between the Canadian and Arctic zones.

These zones are due to a number of factors, among which are latitude, altitude above sea level, annual precipitation and the nature of the soil. It is quite common to find the Arctic zone on high mountains far to the South of the Transition zone; altitude is an important factor, since it affects the mean average temperatures.

Most forms of life are greatly affected by the conditions producing these zones; some plants and animals are restricted to one zone, others may inhabit two or more zones. In the tabulation above, are given a few characteristic plants and animals for each zone, but it must be emphasized that most birds and some mammals migrate; the test of their presence in a zone must be made during the summer when birds are nesting.



(after Upham, U.S. Geol. Survey)

LAKE AGASSIZ

showing its boundaries during
its highest water stage.

(see also page 24)